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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,974	03/31/2004	Masanori Kadotani	520.42565CX1	5958

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EXAMINER	
ARANCIBIA, MAUREEN GRAMAGLIA	
ART UNIT	**PAPER NUMBER**
1763	

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/812,974	KADOTANI ET AL.	
	Examiner	Art Unit	
	Maureen G. Arancibia	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The listing of references (*prior arts 5 and 6*) in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Claim Objections

2. Claims 11-26 are objected to because of the following informalities: On Line 7 of Claim 11, "predetermined values" should be corrected to "predetermined value". On Line 15 of Claim 11, "the" should be inserted before "pressures". On Line 5 of Claim 19, "respectively" is misspelled. On Line 9 of Claim 19, "table to" should be inserted after "specimen". Claims 12-18 and 20-26 are objected to due to their dependence on Claims 11 and 19. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 11-13 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda (JP 9-17770-A) in view of Arasawa et al (US Patent No. Re. 36810). The following rejection refers to the English Machine Translation (EMT) and Figures of Fukuda.

In regards to Claim 11, Fukuda teaches a plasma processing method of processing a specimen W placed on a specimen table 21 disposed inside a processing chamber (Figure 3) using plasma generated therein, wherein the specimen has plural layers of different films (i.e. a masked circuit pattern; EMT, Paragraphs 2-3 and 39), the method comprising:

placing the specimen on the specimen table;

generating a plasma inside the processing chamber and starting the processing of at least one layer of the films of the specimen (Paragraphs 39, 40);

adjusting a temperature difference between a temperature in a central portion of the specimen table and a temperature in an outer circumferential portion of the table to a predetermined value (i.e. zero; Paragraph 34);

providing a heat conducting gas between the rear side of the specimen and an upper surface of the specimen table (Paragraph 35);

changing the pressures of the heat conducting gas in a central space and a circumferential space to a predetermined value (Paragraphs 35-38);

and continuing the processing. (Paragraph 38).

Fukuda does not expressly teach that the temperature difference between a central portion of the specimen table and a temperature in an outer circumferential portion of the table is adjusted to a predetermined value before starting the plasma processing, or that the heat conducting gas is also provided before starting the plasma processing.

Arasawa et al. teaches that the temperature of a specimen W should be adjusted to a predetermined value before beginning plasma processing. (Column 5, Line 59 - Column 6, Line 13)

It would have been obvious to one of ordinary skill in the art to modify the method taught by Fukuda to set the temperature difference between portions of the specimen table and to supply the heat conducting gas before plasma processing is begun, as taught by Arasawa et al. The motivation for doing so would have been to avoid undue thermal stress on the specimen.

In regards to Claim 12, Fukuda teaches that the difference in pressures of the heat conducting gas in the central space and the circumferential space is changed while maintaining the difference in temperature of the portions of the specimen table. (Paragraphs 34-38)

In regards to Claim 13, the embodiment of Fukuda discussed above does not expressly teach a step of adjusting the temperature of the specimen table by adjusting the temperature of coolants passing through each of passages disposed at a central portion and at an outer circumferential potion of the specimen table.

However, Fukuda teaches another embodiment, wherein the temperature of the specimen table is adjusted by adjusting the temperature of coolants passing through passages 14, 11 disposed at a central portion and an outer circumferential portion of the specimen table. (Paragraphs 26-29)

It would have been obvious to one of ordinary skill in the art to combine the two embodiments of Fukuda to have adjust the temperature of the specimen table by

adjusting the temperature of coolants passing through each of passages disposed at a central portion and at an outer circumferential potion of the specimen table. The motivation for making such a modification would have been to combine the fine control over the surface temperature of the wafer provided by each embodiment (Paragraphs 32, 38) to obtain even better control over the surface temperature of the wafer, thereby obtaining a precise and repeatable etching process (Paragraph 41). In other words, one of ordinary skill in the art would expect that since each embodiment of Fukuda attempts such temperature control, using the two embodiments together would produce even better control.

In regards to Claim 19, the combination of Fukuda and Arasawa et al. does not expressly teach that the method is repeated for a second specimen.

However, Fukuda teaches that the method is highly repeatable. (Paragraphs 24, 32, 41)

It would have been obvious to one of ordinary skill in the art to repeat the method taught by the combination of Fukuda and Arasawa et al. to process a second specimen. The motivation for doing so would have been to manufacture numerous semiconductor products with the same degree of etching.

In regards to Claim 20, see the discussion of Claim 12.

In regards to Claim 21, see the discussion of Claim 13.

5. Claims 14-18 and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda in view of Arasawa et al. as applied to claims 11-13, and further in view of Lue et al. (US Patent No. 5,761,023).

The teachings of Fukuda and Arasawa et al. were discussed above.

In regards to Claims 14-16 and 22-24, the combination of Fukuda and Arasawa et al. as applied to Claims 11-13 and 19-21 respectively does not expressly teach that at least one of the pressure of the heat conductive gas, the difference in pressure thereof, and the temperatures of the specimen table are adjusted on the basis of information obtained in advance before the processing of the substrate is started.

Lue et al. teaches that the difference in pressure of a heat conductive gas in two regions is adjusted by a controller 39 on the basis of information (a temperature setpoint) obtained in advance before the processing of a substrate is started. (Column 9, Line 64 - Column 12, Line 22)

It would have been obvious to one of ordinary skill in the art to modify the combination of Fukuda and Arasawa et al. to adjust at least one of the pressure of the heat conductive gas, the difference in pressure thereof, and the temperatures of the specimen table on the basis of information obtained in advance before the processing of the substrate is started. The motivation for doing so, as taught by Lue et al. (Column 9, Line 64 - Column 10, Line 4), would have been to enable a feedback loop to be implemented to control at least one of said variables to a desired value.

In regards to Claims 17 and 25, Fukuda teaches that the difference in pressures of the heat conducting gas in the central space and the circumferential space is changed while maintaining the difference in temperature of the portions of the specimen table. (Paragraphs 34-38)

In regards to Claims 18 and 26, the embodiment of Fukuda applied in Claims 11 and 19 does not expressly teach a step of adjusting the temperature of the specimen table by adjusting the temperature of coolants passing through each of passages disposed at a central portion and at an outer circumferential potion of the specimen table.

However, Fukuda teaches another embodiment, wherein the temperature of the specimen table is adjusted by adjusting the temperature of coolants passing through passages 14, 11 disposed at a central portion and an outer circumferential portion of the specimen table. (Paragraphs 26-29)

It would have been obvious to one of ordinary skill in the art to combine the two embodiments of Fukuda to have adjust the temperature of the specimen table by adjusting the temperature of coolants passing through each of passages disposed at a central portion and at an outer circumferential potion of the specimen table. The motivation for making such a modification would have been to combine the fine control over the surface temperature of the wafer provided by each embodiment (Paragraphs 32, 38) to obtain even better control over the surface temperature of the wafer, thereby obtaining a precise and repeatable etching process (Paragraph 41). In other words, one of ordinary skill in the art would expect that since each embodiment of Fukuda attempts such temperature control, using the two embodiments together would produce even better control.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the

unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 11-26 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 8-11, 14-18, and 21 of copending Application No. 10/372,831 ('831).

Although the conflicting claims are not identical, they are not patentably distinct from each other because the method claimed in the instant application is an obvious way of using the apparatus recited in Claims 8-11, 14-18, and 21 of '831. The recitations of in the instant application of using the apparatus to process multiple substrates, each with a plurality of films, and using set-point data obtained in advance of the processing, are considered to be well-known steps in manufacturing semiconductor devices with repeatability and feedback control. These steps would have been obvious to one of ordinary skill in the art employing the claimed apparatus of '831 to manufacture semiconductor circuits.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

8. Applicant's arguments filed 03/15/2005 have been fully considered but, to the extent to which they still apply, they are not persuasive.

a. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine the two embodiments of Fukuda, as discussed above, would have been to combine the fine control over the surface temperature of the wafer provided by each embodiment to obtain even better control over the surface temperature of the wafer.

b. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

c. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a non-uniform temperature distribution on the specimen) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In this case, the claims merely require control of the temperature of the specimen table or the pressure of the heat-conducting gas. Moreover, it is noted that a difference in temperature or in pressure can be equal to zero.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 5,846,375 to Gilchrist et al. was cited in parent application 10/372,831, and is cited to complete the record in this case.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen G. Arancibia whose telephone number is (571) 272-1219. The examiner can normally be reached on core hours of 10-5, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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